CH2M
501 N. Broadway
St. Louis, MO 63102

March 23, 2023

Ms. Sheila Desai
Work Assignment Manager Section (MCC-lOJ)
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

Subject: Remedial Design Addendum 5, Surrounding Properties
Old American Zinc Plant Superfund Site, Fairmont City, Illinois
Design and Engineering Services (DES) Contract Line Item Number (CLIN) 2
Contract 68HE0318D004
Task Order Number 68HE0521F0068

Dear Sheila,

Enclosed please find the Addendum 5 to the *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Basis of Design Report, Revision 1*, which was prepared to address contaminated soil located in the properties surrounding the Facility Area.

Changes to this document will be made pending comments from EPA and other stakeholders. Otherwise, this document was stamped and signed by the Engineer of Record and will serve as the final document.

Please contact me with any questions or concerns at 269-808-5511.

Sincerely,

CH2M

Sara Maihofer
Project Manager

Enclosure:

- *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 5, Fairmont City, St. Clair County, Illinois*

Memorandum

CH2M HILL, Inc.
6312 S. Fiddler's Green Circle
Suite 300N
Greenwood Village, CO 8011

Subject: **Surrounding Properties Remedial Design Addendum 5**

Project Name: Old American Zinc Plant Superfund Site, Fairmont City, Illinois

Contract Info: Design and Engineering Services (DES), Contract Line Item Number 2 (CLIN 2)
Contract Number 68HE0318D0004, Task Order Number 68HE0521F0068

Attention: Sheila Desai/U.S. Environmental Protection Agency (EPA) Region 5

From: CH2M HILL, Inc. (CH2M)[1]

Date: March 23, 2023

DCN: DES-R5-21F0068-02007

This Remedial Design (RD) Addendum 5 was prepared under EPA Design Engineering Services (DES) Contract Line Item Number (CLIN) 2, Contract 68HE0318D004, Task Order Number 68HE0521F0068, and is the fifth addendum to the *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Final Basis of Design Report, Revision 1* (BODR) (CH2M 2018). This RD Addendum 5 presents the design drawings, excavation limits, excavation volumes, and estimated remediation costs for remedial action (RA) at two properties sampled by CH2M during 2022 predesign sampling activities. The two properties are located in the area near the Old American Zinc Facility Area (FA), referred to as the surrounding properties.

Predesign investigations were also performed on the surrounding properties by ENTACT in the early 2000s and by CH2M in 2017, 2018, 2019, 2020, and 2021. The properties presented in this addendum are in addition to those in the previous RD deliverables:

- Sixty-seven surrounding properties and nine alleyways included in the BODR
- Eighty-four properties and one alleyway included in the *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 1* (CH2M 2019; Addendum 1)
- Twelve properties included in the *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 2* (CH2M 2020a; Addendum 2)
- Five properties included in the *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 3* (CH2M 2020b; Addendum 3)
- Five properties included in the *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 4* (CH2M 2022; Addendum 4)

Sample results were compared to the final cleanup levels presented in Table 1, which are set forth in the Record of Decision (EPA 2012). Yard areas of sampled properties that exceed the final cleanup levels are to be remediated. Attachment 1 summarizes analytical results from the 2022 sampling event. Analytical

[1] CH2M HILL, Inc. is a wholly owned subsidiary of Jacobs Solutions Inc.

data from previous sampling events are included in the documents identified above. Figure G-002 in Attachment 2 shows the properties included in this addendum for remediation.

As discussed in the BODR, the RA will consist of excavating properties to a maximum depth of 30 inches. The properties which are designed to the maximum sample depth of 24 inches, will be screened using X-ray fluorescence (XRF) at the bottom of the excavation. The XRF results will be compared to action limits determined through the site-specific correlation study, which was completed in 2019. Pending the XRF screening results, additional excavations may be completed to a maximum depth of 30 inches. A final XRF screening will be performed at 30 inches to determine whether placement of demarcation fabric is required at the base of the 30-inch excavations. None of the yard areas included in this addendum exceeded cleanup levels in the 18- to 24-inch sample interval; therefore, XRF screening will not be required at the bottom of the excavations, and demarcation fabric will not be needed for the properties included in this addendum.

The BODR also states that garden and landscaped areas will be screened with an XRF prior to excavation to prevent removal of plants and shrubs where possible. If the XRF screening results indicate that the garden and/or landscape areas exceed one or more of the action limits determined by the correlation study, it will be excavated to the same depth as the yard area where it is located. Due to the presence of landscaped areas (which includes the area around plants, shrubs, and trees less than 4 inches in diameter) at both properties included in this addendum, XRF screening will be required within these areas. Yard areas requiring XRF screening for landscaped areas are indicated in the design information table on each property-specific drawing.

Attachment 2 contains the design drawings that show the yard areas requiring remediation, the depth of excavation within each yard area, total excavation volume, and XRF screening requirements. Table 2 summarizes the total excavation volume for each property, maximum exceedance depth for each yard area based on sampling results, and slag observations during the predesign investigation (slag was not observed during predesign sampling at either of the properties included in this addendum). Table 3 summarizes the approximate dimensions of the yard areas requiring remediation for each property.

An estimated 304 cubic yards of soil needs to be excavated for the properties included in this design addendum to address arsenic, cadmium, lead, and/or zinc contamination, based on predesign sampling results. Actual excavation quantities will be determined during the RA. The excavated soil will be transported to the FA for staging until it is placed in the consolidation area during the FA RA. This addendum includes costs for seeding the staging pile to stabilize the soils and prevent transport of contaminated dust particles back into the surrounding properties.

There was no change to the design approach presented in the BODR. Therefore, the BODR, design specifications, construction quality assurance plan, and agency consultation documentation presented in that design are applicable to the properties in this design addendum and have not been revised or resubmitted. Attachment 3 contains an engineer's estimate of construction cost. Production rates for construction were reviewed and updated as needed based on recent project experience. Unit rates are based on 2023 pricing and are applied to quantities for the properties included in this addendum. Additional assumptions used for developing the cost estimate are summarized in documents in Attachment 3.

Professional Engineer Certification Statement

I certify that this document and all appendixes and attachments, as applicable, were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons that manage the system or of persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Name of P.E.:	Matthew Gavin
Registration No.:	062-056650
Date:	March 20, 2023

Exp. 11/30/2023

References

CH2M HILL, Inc. (CH2M). 2018. *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Final Basis of Design Report, Revision 1.* December.

CH2M HILL, Inc. (CH2M). 2019. *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Addendum 1.* July.

CH2M HILL, Inc. (CH2M). 2020a. *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Addendum 2.* January.

CH2M HILL, Inc. (CH2M). 2020b. *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Addendum 3.* July.

CH2M HILL, Inc. (CH2M). 2022. *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 4*. March.

U.S. Environmental Protection Agency (EPA). 2012. *Record of Decision, Old American Zinc Plant Superfund Site*. September.

Tables

Table 1. Final Cleanup Levels

Old American Zinc Plant Superfund Site Surrounding Properties

Contaminant of Concern	Residential (mg/kg)	Non-Residential (mg/kg)
Arsenic	32	239
Cadmium	37	809
Lead	400	826
Zinc	6,400	306,600

mg/kg = milligram(s) per kilogram

Table 2. Excavation Depths and Volume of Excavated Material

Old American Zinc Plant Superfund Site, Surrounding Properties

Figure No.	Property Address	Parcel ID(s)	Section A	Section B	Section C	Section D	Volume of Excavated Material (cubic yards)[a]	Sod Area (square feet)[a]
C-193	[redacted]	02-10.0-101-070	0	18	0	0	73	1,923
C-194	[redacted] RD	02-04.0-203-059	12	18	12	18	231	10,362
						Total:	**304**	**12,285**

Notes:

[a] Excavation volumes and sod areas were calculated using the field measurements collected by CH2M in 2023 and are approximate. The volume calculations assume a 4-inch excavation depth under tree drip zones; however, excavation shall be performed to the full excavation depth identified in the table and drawings to the extent possible.

Properties sampled by CH2M in 2022.

Slag was not encountered at any of the properties included in this table.

Table 3. Approximate Dimensions of Excavation Areas

Old American Zinc Plant Superfund Site Surrounding Properties

Figure No.	Property Address	Parcel ID(s)	Section A		Section B		Section C		Section D	
			Length (ft)	Width (ft)	Length (ft)	Width (ft)	Length (ft)	Width (ft)	Length (ft)	Width (ft)
C-193	[redacted]	02-10.0-101-070			147	15				
C-194	[redacted]	02-04.0-203-059	96	27	115	22	130	20	145	20

Notes:

[a] Due to the irregular shape of the yard areas for this property, lengths were measured at the midpoint of each yard area.

The dimensions presented in this table are based on field measurements collected by CH2M in 2023 and are approximate. Refer to property drawings for more detailed yard area shapes and yard area locations for excavation.

ft = foot, feet

Attachment 1
Arsenic, Cadmium, Lead, and Zinc Results for Properties to be Remediated

Table A1-1. Laboratory Analytical Results for Properties Greater than 5,000 Square Feet

Old American Zinc Plant Superfund Site

			Arsenic (mg/kg)															
			A				B				C				D			
	Property ID	Exceeds?	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"
[redacted]	0020	Yes	6.2	6.9	8.8	8	6.5	8.1	17	11	4	6.9	5.5	11	6.6	8.5	8.9	7.7
	0037	No	9.3	5.3	7.1	7.2	7.2	7.2	7	5.6	14 J	10	7	7.2	6.6	9.5	8.8	7.5
	0892	No	6.3	6.6	7.8	7	6.7	6.9	5.1	4.1	7.1	5.3	4.4	3.3	6.2	7.4	5.7	4.9
	0231	No	5.6	8.8	8	8.5	6.3	6	6.1	8.5	5.1	5.4	8	9.7	6.6	6.6	9.8	8.3
	0277	No	7.7	4.5	7.3	8.2	7.3	9.6	7.2	9	9	9.3	6.9	7	8.6	7.8	8	6.5
	1024	No	7	6.7	6.4	5.6	9.7	4.4	7.4	6.9	6	5.6	8.5	5.3	4.5	6	6.6	8.2
	0804	No	4.7	4.8	3.9	5.6	6.2	8.1	4.8	5.3	5.2	7.3	4.8	5.9	6.4	5.5	3	7.2
	0922	Yes	4.1	5.9	5.4	3.7	6.5	6.5	5.9	4.3	6 J	5.7	4.5	4.8	3.5	6.8	8.9 J	5
	0363	No	6.3	12	5.7	6.1	6.7	8.8	5.9	6.4	16	9.2	7.8	7.3	11	12	9.3	7
	0374	No	7.5	6.7	14	10	7.1	9.3	10	11	7.3	7.9	6.5	5.5	6.2	9.3	17	13
	0888	No	5.3	5.5	10	5.9	9.2	9.9	6.7	4.5	8.5	6.6	5.1	5.6	10	5.4	5.6	5.6

Notes:

" - inches below ground surface

'-' - no data for depth interval or sample section

J - the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

U - the analyte was analyzed for but was not detected above the reported sample quantitation limit or the analyte concentration is less than five times the blank concentration

mg/kg - milligrams per kilogram

Results equal to or exceeding the cleanup levels are shaded.

Residential cleanup levels are 32 mg/kg for arsenic, 37 mg/kg for cadmium, 400 mg/kg for lead and 6,400 mg/kg for zinc.

Table A1-1. Laboratory Analytical Results for Properties Greater than 5,000 Square Feet

Old American Zinc Plant Superfund Site

			Cadmium (mg/kg)															
			A				B				C				D			
Property Address	Property ID	Exceeds?	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"
[redacted]	0020	Yes	7.6	5.1	14	26	9.6 J	17	64	8.3	2.7	2.9	7.4	33	8	4.7	8.5	1.6
	0037	No	23 J	3.7	5.9	6	12	10	2.8	7.5	23 J	2.5	1.4	1.3	7	6.6	4.1	1.7
	0892	No	13	9.9	9.5	23	20	8.2	5.4	3.2	16	16	10	0.8	6.7	9.9	4.9	6.3 J
	0231	No	3.2	6.6	7.8	8.3	2.9	2.6	2.1	7.1	3.2	4.7	8	5.2	8.9 J	9	8.2	4.2
	0277	No	6	2.3	5.8	6	4.8 J	7	4.7	6.5	6.6	7.2	2.8	1.3	6.7	5.8	2.8	2.3
	1024	No	12	4.9	1.2	0.82	30	8.3	5.9 J	1.8	6.9	4.9	3.2	1.9	11	8	3.1	1.1
	0804	No	1	0.96	11	3.6	1	16	11	26	2.1	13	7.9	15	2.1	1	12	34
	0922	Yes	16	26	7.1	7.7 J	53	7.4	16	1.9	23	19	7.1	7.7	15	9.8	15 J	18
	0363	No	20	13	4.7	2.1	19	13	2.5	6 J	23	21	7	10	20	16	8	8.1
	0374	No	11	9.3	35	17	6.5	15	11	20 J	13	11	2.6	4.2	11	10	18	7.4
	0888	No	10	11 J	13	4.9	13	13	13	2.3	9.2	7	7.9	1.3	13	6.8	4.9	1.5

Notes:

" - inches below ground surface

'-' - no data for depth interval or sample section

J - the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

U - the analyte was analyzed for but was not detected above the reported sample quantitation limit or the analyte concentration is less than five times the blank concentration

mg/kg - milligrams per kilogram

Results equal to or exceeding the cleanup levels are shaded.

Residential cleanup levels are 32 mg/kg for arsenic, 37 mg/kg for cadmium, 400 mg/kg for lead and 6,400 mg/kg for zinc.

Table A1-1. Laboratory Analytical Results for Properties Greater than 5,000 Square Feet

Old American Zinc Plant Superfund Site

			Lead (mg/kg)															
			A				B				C				D			
Property Address	Property ID	Exceeds?	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"
[redacted]	0020	Yes	98	150	270	110	170 J	120	770	120	45	53	99	180 J	110	47	42	16
	0037	No	130	37	42	56	230	26	31	21	320 J	44	25	22	140	91	95	47
	0892	No	140	100	120	140	160	52	32	28	150	110	50	12	130	120	58	51 J
	0231	No	34	56	48	45	29	22	24	42	29	33	50	25	62	58	52	20
	0277	No	71	23	57	55	46 J	71	39	41	57	52	20	19	68	38	16	18
	1024	No	200	36	18	15	390	280	120 J	27	95	47	42	30	320	55	58	19
	0804	No	17	19	150	23	22	200	46	67	30	180	66	100	34	18	61	190
	0922	Yes	240	420	330	210 J	470	400	480	260	470	610	270	350	210	200	450	260
	0363	No	200	44	25	21	190	74	16	64 J	110 J	100	59	27	220	76	54	24
	0374	No	96	68	240	98	100	380	220	27	190	230	27	21	76	110	270	36
	0888	No	69	38	170	28	200	97	130	18	110	78	27	17	190	45	40	14

Notes:

" - inches below ground surface

'-' - no data for depth interval or sample section

J - the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

U - the analyte was analyzed for but was not detected above the reported sample quantitation limit or the analyte concentration is less than five times the blank concentration

mg/kg - milligrams per kilogram

Results equal to or exceeding the cleanup levels are shaded.

Residential cleanup levels are 32 mg/kg for arsenic, 37 mg/kg for cadmium, 400 mg/kg for lead and 6,400 mg/kg for zinc.

Table A1-1. Laboratory Analytical Results for Properties Greater than 5,000 Square Feet

Old American Zinc Plant Superfund Site

			Zinc (mg/kg)															
			A				B				C				D			
Property Address	Property ID	Exceeds?	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"	0–6"	6–12"	12–18"	18–24"
[redacted]	0020	Yes	540	320	850	560	620	740	2500	350	170	170	330	740	470	280	410	150
	0037	No	920	260	280	210	800	400	170	330	1500 J	170	190	140	420	520	330	140
	0892	No	620	520	410	930	660	390	440	220	680	640	490	65	330	480	290	310
	0231	No	160	300	290	290	170	120	110	280	170	210	300	240	450	320	280	220
	0277	No	340	180	260	280	210 J	270	190	230	270 J	240	230	120	280	240	190	130
	1024	No	610	280	130	60	1600	930	1600 J	190	530	280	250	200	760	370	380	94
	0804	No	88	73	820	580 J	79	840	610	1200	140	1100	1200	1100	120	66	440	1400
	0922	Yes	1500	2100	2000	1500 J	1900	790	1300	680	1200	1100	480	760	880	710	1200	1100
	0363	No	1300	360	300	220	670	390	220	300 J	590	550	300	320	560	430	400	370
	0374	No	620	380	1800	380	480	1700	570	2400 J	700	590	140	170	390	670	1100	520
	0888	No	370	380 J	410	250	530	450	540	170	380	330	430	77	530	270	300	190

Notes:

" - inches below ground surface

'-' - no data for depth interval or sample section

J - the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

U - the analyte was analyzed for but was not detected above the reported sample quantitation limit or the analyte concentration is less than five times the blank concentration

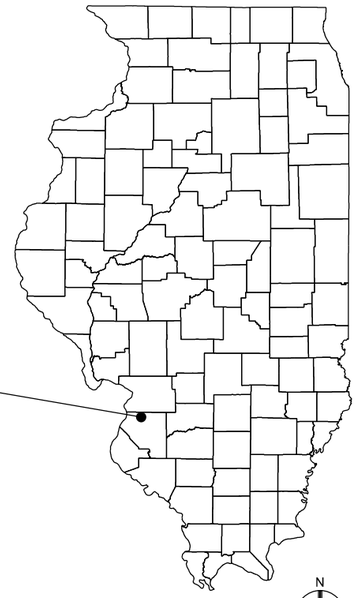
mg/kg - milligrams per kilogram

Results equal to or exceeding the cleanup levels are shaded.

Residential cleanup levels are 32 mg/kg for arsenic, 37 mg/kg for cadmium, 400 mg/kg for lead and 6,400 mg/kg for zinc.

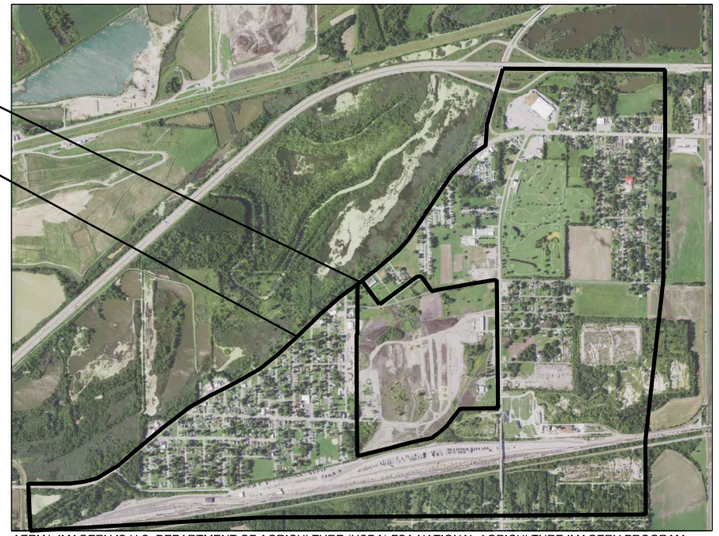
Attachment 2
Design Drawings

US ENVIRONMENTAL PROTECTION AGENCY
OLD AMERICAN ZINC PLANT SUPERFUND SITE
SURROUNDING PROPERTIES REMEDIAL DESIGN - ADDENDUM 5
FAIRMONT CITY, ST. CLAIR AND MADISON COUNTIES, ILLINOIS



VICINITY MAP
NTS

N



AERIAL IMAGERY IS U.S. DEPARTMENT OF AGRICULTURE (USDA) FSA NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) DATED SEPTEMBER 22, 2019 (RESOLUTION 0.60 METERS) AND MAY NOT REPRESENT CURRENT CONDITIONS

LOCATION MAP
NTS

N

INDEX TO FIGURES

NOTE:
ADDENDUM 4 ENDED AT FIGURE NUMBER C-192. THEREFORE, ADDENDUM 5 DRAWINGS START AT FIGURE C-193.

NO.	DATE	DR	CHK	APVD	REVISION	BY	APVD
DSGN	R VAUGHAN	N LINDHOLM	R GRAND			M GAVIN	

US ENVIRONMENTAL PROTECTION AGENCY
OLD AMERICAN ZINC PLANT SUPERFUND SITE
SURROUNDING PROPERTIES REMEDIAL DESIGN
FAIRMONT CITY, ST. CLAIR COUNTY, ILLINOIS

GENERAL

TITLE, LOCATION MAPS AND INDEX TO FIGURES

FINAL DESIGN - ADDENDUM 5

CH2M
MATTHEW D. GAVIN
LIC. NO. 062-056650

DATE: 3/15/2023

SIGNATURE AND SEAL APPLY TO ALL SHEETS 1-6 OF 6

LICENSED PROFESSIONAL ENGINEER
MATTHEW D. GAVIN
#062-056650
STATE OF ILLINOIS

EXPIRATION DATE: 11/30/2023

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	MAR 2023
PROJ	D3522700
DWG	G-001
SHEET	1 of 6

FILENAME: Addendum 5 Title Sheet.dgn PLOT DATE: PLOT TIME:

NOTE: AERIAL IMAGERY IS U.S. DEPARTMENT OF AGRICULTURE (USDA) FSA NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) DATED SEPTEMBER 22, 2019 (RESOLUTION 0.60 METERS) AND MAY NOT REPRESENT CURRENT CONDITIONS

N

0 450 900 1350

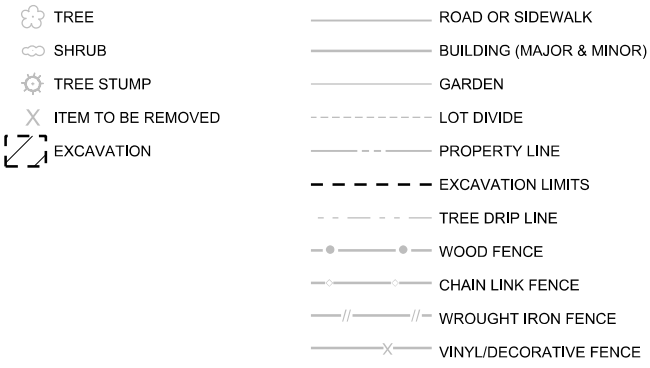
1"=450'

FIGURE G-002
PROPERTIES TO BE REMEDIATED

OLD AMERICAN ZINC PLANT SUPERFUND SITE
FINAL DESIGN - ADDENDUM 5 SUBMITTAL MARCH 2023
REVISION - 0

ch2m

LEGEND



ABBREVIATIONS

A/C	AIR CONDITIONER
CY	CUBIC YARDS
DIA, Ø	DIAMETER
MAX	MAXIMUM
MIN	MINIMUM
(TYP)	TYPICAL
USEPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

GENERAL SITE NOTES:

1) TREES AND SHRUBS WILL BE REPLACED WITH TREES AND SHRUBS OF SIMILAR SPECIES AND QUANTITIES REMOVED. REPLACEMENT TREES WILL BE 2-INCH CALIPER TREES OF SAME SPECIES AS PRACTICABLE.

2) WORK SHOWN ON DRAWINGS TO BE COMPLETED ACCORDING TO SPECIFICATIONS.

3) YARD AREA NOMENCLATURE SHOWN ON DRAWINGS IS BASED ON NAMING CONVENTIONS FROM SAMPLING EVENTS PERFORMED BY CH2M.

4) UNDERGROUND AND OVERHEAD UTILITIES ARE NOT SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE PRIOR TO CONSTRUCTION.

5) TOTAL EXCAVATION VOLUME SHOWN ON DRAWINGS ASSUMES A 4-INCH EXCAVATION DEPTH WITHIN TREE DRIP ZONES; HOWEVER, EXCAVATION WILL BE PERFORMED TO THE FULL EXCAVATION DEPTH IDENTIFIED IN THE DRAWINGS, TO THE EXTENT POSSIBLE.

FIGURE G-003
LEGEND
OLD AMERICAN ZINC PLANT SUPERFUND SITE
FINAL DESIGN - ADDENDUM 5 SUBMITTAL MARCH 2023
REVISION - 0

ch2m

001-G-3_687729-3.dgn

SHEET KEYNOTES

1. CONTRACTOR WILL PROVIDE EROSION CONTROL MEASURES AROUND EXCAVATED SOIL STOCKPILE AREA. BACKFILL MATERIAL STOCKPILES AND PROPOSED STAGING AREA.
2. EXACT LOCATION TO BE DETERMINED DURING REMEDIAL ACTION. CONTRACTOR WILL ALSO DETERMINE LOCATION FOR STOCKPILING BACKFILL MATERIAL FROM BORROW SOURCES.
3. DECONTAMINATION PAD SHALL BE CONSTRUCTED BY FACILITY AREA CONTRACTOR.

NOTE: AERIAL IMAGERY IS U.S. DEPARTMENT OF AGRICULTURE (USDA) FSA NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) DATED SEPTEMBER 22, 2019 (RESOLUTION 0.60 METERS) AND MAY NOT REPRESENT CURRENT CONDITIONS

FIGURE G-004
PROPOSED STOCKPILE AND STAGING AREAS

OLD AMERICAN ZINC PLANT SUPERFUND SITE
FINAL DESIGN - ADDENDUM 5 SUBMITTAL MARCH 2023
REVISION - 0

ch2m

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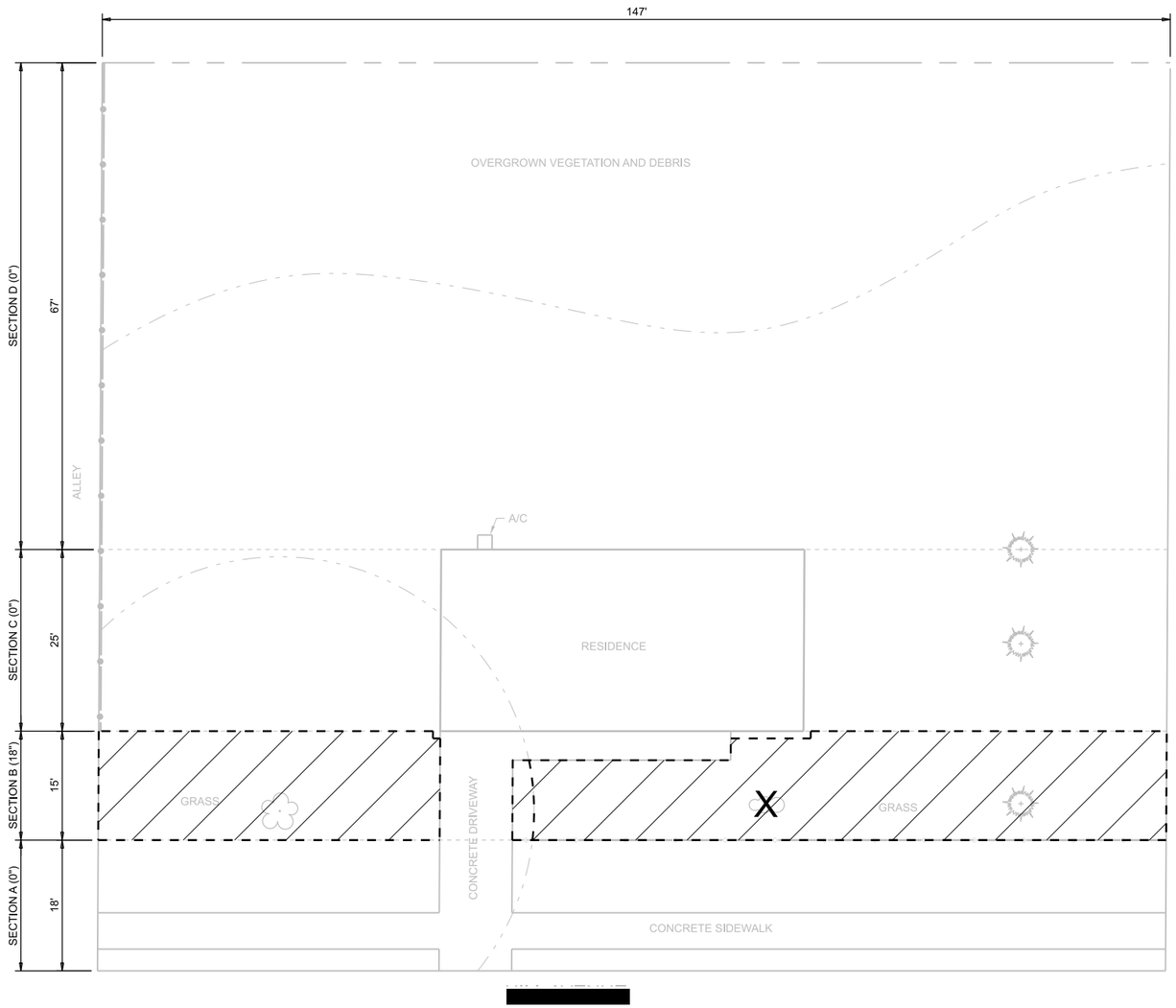

DESIGN INFORMATION

	SECTION A	SECTION B	SECTION C	SECTION D
EXCAVATION DEPTH	0"	18"	0"	0"
XRF EXCAVATION BOTTOM	NO	NO	NO	NO
XRF LANDSCAPED AREA	NO	YES	NO	NO
SLAG OBSERVED	NO	NO	NO	NO
EXCAVATION VOLUME	73 CY			
SOD AREA	1,923 SF			

LEGEND

TREE
SHRUB
EXCAVATION
ITEM TO BE REMOVED
PROPERTY LINE
TREE DRIP LINE
BUILDING
YARD AREA DIVIDE

LOCATION MAP

[redacted]

GENERAL NOTES

1. PROPERTY BOUNDARIES AND EXCAVATION LIMITS ARE BASED ON PROPERTY BOUNDARIES FROM MADISON AND ST. CLAIR COUNTIES AND HAVE NOT BEEN SURVEYED. BASED ON VISUAL PROPERTY INSPECTIONS, SOME FEATURES MAY BE OUTSIDE PROPERTY BOUNDARIES AND ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY.
2. PROPERTY FEATURES ARE NOT SURVEYED AND THEIR LOCATION SHOULD BE CONSIDERED APPROXIMATE.
3. PROPERTY AND EXCAVATION DIMENSIONS ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY AND SHOULD BE CONSIDERED APPROXIMATE. FIELD DETERMINATION OF YARD AREA DIVIDES SHOULD BE BASED ON YARD AREA DIVIDE LOCATION RELATIVE TO PROPERTY FEATURES AS SHOWN ON THE FIGURE.
4. AERIAL IMAGERY IS U.S. DEPARTMENT OF AGRICULTURE (USDA) FSA NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) DATED SEPTEMBER 22, 2019 (RESOLUTION 0.60 METERS) AND MAY NOT REPRESENT CURRENT CONDITIONS.

PROPERTY SPECIFIC NOTES

1. PERFORM XRF SCREENING IN GARDEN AREA AND/OR AREA AROUND SHRUBS. AREA(S) WILL BE EXCAVATED PENDING XRF SCREENING RESULTS.

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0 10 20

SCALE IN FEET

FIGURE C-193

[redacted]

PARCEL ID(S): 02-10.0-101-070

OLD AMERICAN ZINC PLANT SUPERFUND SITE
FINAL DESIGN - ADDENDUM 5 SUBMITTAL MARCH 2023
REVISION - 0

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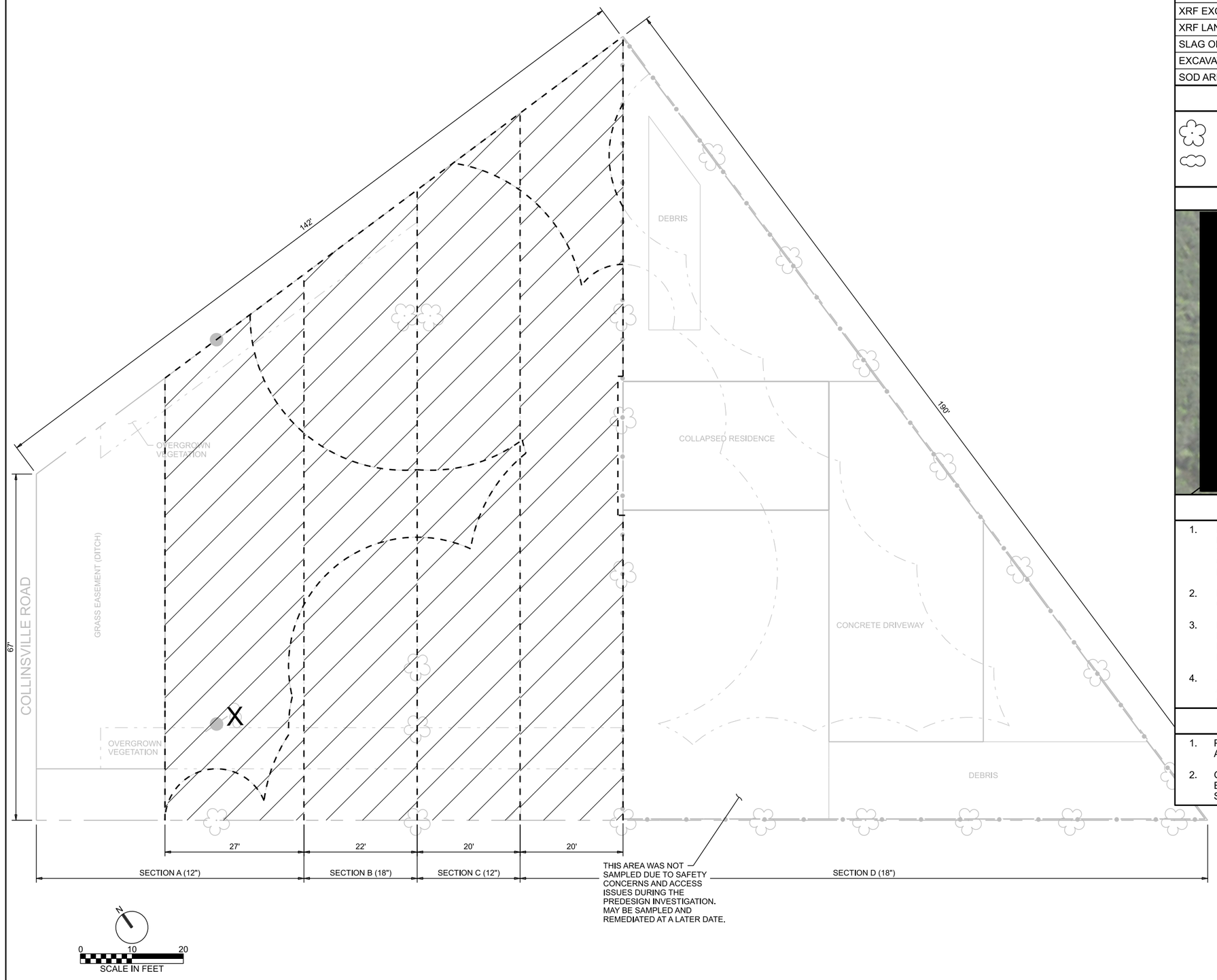


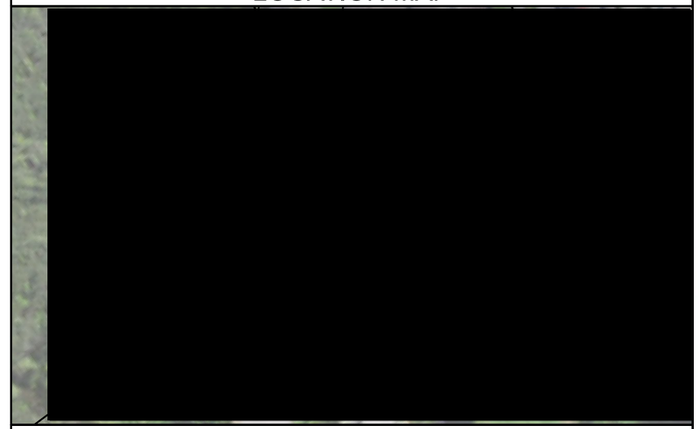
DESIGN INFORMATION

	SECTION A	SECTION B	SECTION C	SECTION D
EXCAVATION DEPTH	12"	18"	12"	18"
XRF EXCAVATION BOTTOM	NO	NO	NO	NO
XRF LANDSCAPED AREA	YES	NO	NO	NO
SLAG OBSERVED	NO	NO	NO	NO
EXCAVATION VOLUME	231 CY			
SOD AREA	10,362 SF			

LEGEND

TREE
SHRUB
EXCAVATION
ITEM TO BE REMOVED
PROPERTY LINE
TREE DRIP LINE
BUILDING
YARD AREA DIVIDE

LOCATION MAP



GENERAL NOTES

1. PROPERTY BOUNDARIES AND EXCAVATION LIMITS ARE BASED ON PROPERTY BOUNDARIES FROM MADISON AND ST. CLAIR COUNTIES AND HAVE NOT BEEN SURVEYED. BASED ON VISUAL PROPERTY INSPECTIONS, SOME FEATURES MAY BE OUTSIDE PROPERTY BOUNDARIES AND ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY.
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PROPERTY SPECIFIC NOTES

1. PERFORM XRF SCREENING IN GARDEN AREA AND/OR AREA AROUND SHRUBS. AREA(S) WILL BE EXCAVATED PENDING XRF SCREENING RESULTS.
2. GRASS EASEMENTS ALONG COLLINSVILLE ROAD ARE NOT INCLUDED IN EXCAVATION EXTENTS. THE EASEMENT AS SHOWN IS BASED ON PREDESIGN SAMPLING LOCATIONS.

FIGURE C-194

[redacted]

PARCEL ID(S): 02-04.0-203-059

OLD AMERICAN ZINC PLANT SUPERFUND SITE
FINAL DESIGN - ADDENDUM 5 SUBMITTAL MARCH 2023
REVISION - 0

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Attachment 3
Engineer's Estimate of Construction Cost

Attachment 3

Basis of Estimate
Old American Zinc Plant Superfund Site—
Surrounding Properties
Remedial Design Addendum 5

Fairmont City, St. Clair County, Illinois
Design and Engineering Services (DES) Contract
Line Item Number (CLIN) 2
Contract 68HE0318D004
Task Order Number 68HE0521F0068

Project Name: Old American Zinc Plant Superfund Site – Surrounding Properties Remedial Design Addendum 5

Class Estimate: Class 2 Project Budget Estimate

Project Manager: Sara Maihofer/MKE

Senior Technical Consultant: Beth Rohde/MKE

Estimated By: Mark Allen/DEN

Estimate Date: March 15, 2023

1. Purpose of Estimate

This basis of estimate is included as Attachment 3 to the *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 5, Fairmont City, St. Clair County, Illinois* (CH2M HILL, Inc. [CH2M] 2022; Addendum 5) and should only be viewed in conjunction with the design addendum.

This budget cost estimate provides an engineer's estimate of anticipated capital costs for the excavation, backfill, and restoration of two properties near the Old American Zinc (OAZ) Facility Area (FA), referred to as the surrounding properties. The following sections outline assumptions that apply to this estimate.

This basis of estimate should be reviewed in conjunction with the Microsoft Excel spreadsheet (Attachment A) that outlines the anticipated capital costs for the project.

2. General Project Description

The OAZ Plant Superfund Site is located in the Village of Fairmont City in St. Clair County, Illinois. The site includes a 132-acre FA and surrounding properties where elevated metals concentrations associated with the facility operation were found in different media. The FA is bordered by several commercial and industrial properties, including Garcia Trucking to the west, CSX Intermodal railroad yard to the south, and General Chemicals to the east. The site also includes properties near the FA (surrounding properties), primarily in Fairmont City.

OAZ conducted zinc-smelting operations at the FA from 1916 to 1967. Slag from the smelting operation was cooled by placing the molten material along the northern and western boundaries of the FA. The slag stockpiles originally encompassed an area of 15 acres. The FA, including the clinker and other smelting residues on the property, was purchased by XTRA Intermodal, Inc. (XTRA), in 1979. XTRA operated a trucking terminal at the FA until 2003 that included lease, storage, and maintenance of a diverse fleet of trailers. XTRA ground and redistributed the slag stockpiles on the FA to build up and level the former plant site to facilitate its trucking operation. At present, redistributed slag on the FA covers an area of 125 acres, with thickness ranging from 6 inches to 9 feet (ENTACT 2012).

Remediation of the OAZ Plant Superfund Site includes both on-FA and off-FA activities. Samples collected during various investigations over many years indicate that over 200 properties and 15 alleyways exceeded the cleanup levels for at least one contaminant of concern. The budget cost estimate described herein, which includes estimated capital costs, is for remedial action of the two properties included in this design addendum (off-FA). Properties and alleyways with elevated lead concentrations were prioritized for removal action and are not included in this design addendum or cost estimate. In addition, properties and alleyways included in prior investigations or design packages are also excluded from this design addendum and budget cost estimate.

3. Project Objective

EPA's selected remedy for the site is Alternative 4A, as described in the Record of Decision (EPA 2012). The overall strategy for the site is to contain and cover the low-level-threat waste to reduce future human health and ecological risk to acceptable levels.

The remedial action will be performed by EPA's (owner's) representative and a primary contractor (contractor). There will also be supporting contracts for laboratory analysis, waste disposal (if needed), etc. This basis of estimate was created based on the following major activities:

- Mobilization

- Site preparation
- Excavation of soil above applicable cleanup levels from off-FA properties
- Transportation of excavated soils to the FA for direct placement into the consolidation area
  - Depending on construction sequencing, excavated soils may be placed in an excavated soil staging pile at the FA (soil staging pile)
- Containerizing decontamination liquids and water that accumulates in unlined excavations for dust suppression at the FA in areas that have not been remediated
- Backfill and compaction in excavated areas
- Site restoration and maintenance
- Demobilization

3.1 Administration/Subcontractor Oversight

This budget cost estimate assumes that, in addition to the contractor cost shown on the Class 2 Cost Estimate Summary, administration and oversight by the owner's representative will be necessary. The administration and contractor oversight cost percentage has been estimated based on the *Cost Guidance* (EPA 2000) document, Region 5 contract, and site experience executing similar work at other residential RA projects.

3.2 Assumptions

This estimate is based on the quantities, sizes, and calculations presented in Addendum 5, and the BODR presents key design assumptions and quantity assumptions. The following exclusions and assumptions supplement Section 3.1 of the BODR and are presented as conditions for the attached budget cost estimate:

- The estimate is based on 2023 pricing. Costs for mobilization, facilities setup, and demobilization are included in this budget estimate, as reflected in the individual line items in the budget cost estimate spreadsheet (Attachment A).
- A separate correlation study and coordination and community relations meetings will not be required for the properties included in this addendum. Therefore, costs for these items are excluded from this budget cost estimate, as stated in the individual line items in the budget cost estimate spreadsheet (Attachment A).
- Drawings used for this estimate were prepared by CH2M (engineer; Addendum 5, Attachment 2).
- This budget cost estimate is not an offer to contract for and/or procure the work but does represent the engineer's best opinion of cost before bidding documents are developed and released to prospective contractors.
- The budget cost estimate does not include cost allowance for unforeseen site conditions.

4. Total Capital Cost

The following is a summary breakdown of the estimated total capital cost. See Attachment A for additional detailed information.

Low Range	Estimate Range	High Range
-15%	**Total $**	+20%
$203,400	$239,300	$287,200

5. Cost Factors

The following cost factors were applied to the estimate:

Estimate Contingency	15%
Bond/Insurance	2.50%
Owner's Representative Markup	5%
Administration and Contractor Oversight	25%
Escalation Rate	0%

An escalation rate was not applied to this cost estimate because it was developed using 2023 pricing, and the work is anticipated to occur in 2023. Attachment A contains the detailed budget estimate.

6. Estimate Classification

This budget estimate is considered a Class 2 estimate as defined by AACE International. It is considered accurate to -15%/+20% based on the current level of the design and design addendum documents.

The budget estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final cost of the project will depend upon competitive market conditions, implementation schedule, and other variable factors. As a result, the final project costs will vary from the estimates presented herein.

7. Cost Resources

The following is a list of the various cost resources used in the development of the rough order of magnitude estimate:

- CH2M engineers' estimate with assumptions as noted in supporting tables.
- HCSS Heavy Bid Estimating Software, Version 2022.2.
- Estimator judgment and experience.
- Quantity takeoff of anticipated activities.
- Quantities were priced using a detailed built-up approach. Crews were built up using Davis-Bacon Act labor rates for St. Clair County, Illinois, updated March 2, 2023. Construction equipment costs are 80% of Blue Book rental/cost recovery rates for Illinois. Fuel costs used are current average prices for gasoline and diesel. Material costs were based on budgetary quotations from vendors.

- Production rates were based on the CH2M estimator's experience and previously estimated rates for the project. Other items were based on RSMeans Cost Data and bids received for recent similar work.

Oversight labor unit prices reflect a burdened rate, including the following: workers compensation, unemployment taxes, fringe benefits, and medical insurance.

8. Estimate Methodology

This budget cost estimate is considered a bottom rolled-up type of estimate with detailed direct-cost breakdown of labor, materials, and equipment. Nonbinding cost quotations for materials and services were obtained when possible. Estimator judgment and experience were used to price materials and services whenever nonbinding cost quotations were not available. The estimate may include allowance cost for certain components of the estimate (that is, weather delays, production restraints, etc.).

9. Labor Costs

This budget cost estimate is based upon current local knowledge of construction labor rates. Labor costs were estimated using Davis-Bacon Act labor rates for St. Clair County, Illinois, updated March 2, 2023.

10. Sales Tax

This budget estimate does not include sales tax separately. A 7.92% state sales tax was applied to purchased equipment and materials in the estimate.

11. Works Cited

CH2M HILL, Inc. (CH2M). 2018. *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Final Basis of Design Report, Revision 1.* December.

CH2M HILL, Inc. (CH2M). 2019. *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 1, Fairmont City, St. Clair County, Illinois.* July.

CH2M HILL, Inc. (CH2M). 2020a. *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 2, Fairmont City, St. Clair County, Illinois.* January.

CH2M HILL, Inc. (CH2M). 2020b. *Old American Zinc Plant Superfund Site, Surrounding Properties Remedial Design Addendum 3, Fairmont City, St. Clair County, Illinois.* July.

CH2M HILL, Inc. (CH2M). 2022. *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Addendum 4.* March.

CH2M HILL, Inc. (CH2M). 2023. *Old American Zinc Plant Superfund Site Surrounding Properties Remedial Design Addendum 5.* March.

ENTACT. 2012. *Final Feasibility Study Document for the Old American Zinc Plant Site, Fairmont City, Illinois*. February.

U.S. Environmental Protection Agency (EPA). 2012. *Record of Decision, Old American Zinc Plant Superfund Site*. September.

U.S. Environmental Protection Agency (EPA). 2000. *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*. July.

Attachment A
Budget Cost Estimate Spreadsheet

Attachment 3. Unit Rates for Anticipated Property Excavation, with Final Seeding of Excavated Soil Staging Pile

Old American Zinc Plant Superfund Site Surrounding Properties, Addendum 5

Item	Qty	Unit[a]	Unit Price	Total (Rounded)	Notes
Preconstruction Activities	-	LS	$ 4,100	$ -	Assumes that properties in the addendum will be performed under the same Work Pan, Health and Safety Plan/Activity Hazard Analyses, schedule, training, premobilization submittals, etc. as the properties and alleyways included in the Revised Final Design and Addendums 1, 2, 3, and 4. Per email from EPA on 1/26/2023, no additional costs for revisions and updates to these documents are included for Addendum 5 properties.
Correlation Study	-	LS	-	-	Assume that properties in the addendum will be performed under the XRF correlation study completed for the properties and alleyways included in the Revised Final Design and Addendums 1, 2, 3 and 4.
Coordination Meeting	-	LS	-	-	Coordination meeting with city, county, and township representatives. Per email from EPA on 1/26/2023, assume no additional meeting(s) are needed for the properties included in Addendum 5. Estimated costs for this meeting were included in the Revised Final Design and therefore are excluded from the addendum.
Mobilization and Demobilization	1	LS	$ 16,809	$ 16,800	Mobilize and demobilize equipment and materials to site and prepare staging areas.
Setup Facilities	1	LS	$ 8,515	$ 8,500	Setup construction trailer, temporary soil erosion and sedimentation control measures, facilities, stockpile areas, parking areas.
Community Relations, two (2) mtgs	1	LS	$ 4,685	$ 4,700	Assume two (2) public meetings throughout the course of construction. Each meeting includes labor for preparation and attendance. Costs for community meetings for Addendum 5 properties are inluded, per email from EPA on 1/26/2023.
Air Monitoring	10	DY	$ 561	$ 5,600	Labor, equipment, and materials to conduct air monitoring at residential properties included in the addendum and the Facility Area throughout the project construction.
Initial Preconstruction Meeting	2	EA	$ 864	$ 1,700	Document existing property condition with digital photos and videos. Attendees include owner's representative, contractor, and landscaping subcontractor to prepare plant inventory.
Second Preconstruction Meeting	2	EA	$ 540	$ 1,100	Document Property Owner approval of the work to be performed. Attendees include owner's representative, contractor, and landscaping subcontractor to finalize plant inventory.
Clearing and Site Preparation at Properties	2	EA	$ 1,871	$ 3,700	Clear & grub grasses and root systems, removal of trash, debris, shrubs, swing sets, benches, and other obstructions.
Transport Yard Waste - Mixed	1	TN	$ 81	$ 100	Transport of trees, shrubs, miscellaneous wood, metal, and debris. Assume 0.5 ton per property.
Tree Removal (2"-4" dia)	-	EA	$ 479	$ -	Based on actual costs incurred on a similar project. Includes stump removal.
Excavation	304	BCY	$ 97	$ 29,500	Excavation with a small excavator and some by hand. Signage and protective measures for pedestrian traffic on sidewalks or streets, as required. SESC measures as required. Assumes excavation to 30-inches will not be required for any Addendum 5 properties because deepest excavation depth is 18" based on sampling results.
Demarcation Fabric	-	SF	$ 2.14	$ -	High visibility fencing for excavations completed to 30 inches, and XRF screening results are above screening criteria. Estimated based on COC concentrations at maximum sample depth. Deepest excavation for Addendum 5 properties is 18" based on sampling results; therefore, it is assumed demarcation fabric will not be needed for any Addendum 5 properties.
Transport Material to Facility	426	TN	$ 10	$ 4,300	Transportation of soil to the Facility Area. Conversion from bank cubic yards (BCY) to ton (TN) based on what is being seen on other similar projects in the region.
Stabilize and manage Staging Pile	1	LS	$ 19,685	$ 19,700	Labor, equipment, and materials to slope, shape, and manage material from addendum properties in the staging pile at the Facility Area. Assumes 0.02 acre footprint with 4 inches of topsoil placed over staging pile before hydroseeding. Includes costs for additional topsoil and hydroseeding of excavated material from properties included in addendum.
Backfill - General	189	CY	$ 75	$ 14,200	Includes assistance with quality assurance/quality control (QA/QC) sampling, purchase/delivery, installation, compaction, and density testing of general backfill.
Backfill - Topsoil	115	CY	$ 91	$ 10,500	Includes assistance with QA/QC sampling, purchase/delivery, and installation of topsoil.
Backfill - Select Topsoil	-	CY	$ 95	$ -	Includes assistance with QA/QC sampling, purchase/delivery, and installation of select topsoil.
Backfill - CA-6 Aggregate	-	TN	$ 88	$ -	Includes assistance with QA/QC sampling, purchase/delivery, and installation of gravel (IDOT CA-6).
Street Sweeping	1	MO	$ 7,722	$ 7,700	Performed from start of excavation through topsoil placement for properties included in addendum.
Landscape - Supply/Plant Perennials	-	EA	$ 54	$ -	Planting beds and perennials were not identified on any Addendum 5 properties.
Landscape - Supply/Plant Shrubs	2	EA	$ 182	$ 400	HCSS Estimate.
Landscape - Supply/Plant Trees	-	EA	$ 634	$ -	Material costs obtained from local nurseries. Production rates from RSMeans.
Landscape - Warranty/Replacement	1	LS	$ 48	$ 48	Based on RSMeans. Assume 12% die off. Includes perennials, shrubs, and trees; LS is 12% of landscape costs.
Restoration - Sod Placement and Maintenance	12,285	SF	$ 1.12	$ 13,800	Includes 4-week maintenance/watering period for each property (for up to a total of 10 watering events per property).
Restoration - Concrete Repair	1	CY	$ 803	$ 800	Assume 10 feet of repair at each property where access will occur from/over sidewalk. Assumes 5 ft wide sidewalk, 6-inches thick and 4,500 pounds per square inch. Also includes replacement of existing concrete in disrepair at properties.
Restoration - Asphalt	-	SF	$ 5	$ -	Restoration of any damaged asphalt during backfill and restoration activities. Assume 3-inches thick. IDOT A-3 surface material. Also includes replacement of existing asphalt in disrepair at properties. Due to limited number of properties in Addendum 5, this cost was excluded.
Fence Replacement - Chain Link	16	LF	$ 160	$ 2,600	Assume 2 8-ft panels replaced at 1 property. Includes separate mobilization by fencing subcontractor to come out and install the fence panels.
Post Construction Meeting	2	EA	$ 324	$ 600	Document issues identified during work, outstanding punch list items, and substantial completion at the property. Attendees include owner's representative, contractor, and landscaping subcontractor.
Analytical Sampling	2	EA	$ 1,297	$ 2,600	Initial and QA/QC samples for general backfill, topsoil, etc.
XRF Rental	1	MO	$ 7,780	$ 7,800	X-ray fluorescence (XRF) rental for properties included in addendum. Make/Model: Niton XL3t 800. www.kwipped.com
Payment and Performance Bond	2.50%	of	$ 156,748	$ 3,900	
Contingency	15%	of	$ 156,748	$ 23,500	
SUBTOTAL CONSTRUCTION				**$ 184,100**	
Optional Items					
Utility Locates	1	EA	$ 356	NA	Unit pricing for utility locating, if determined necessary by owner's representative.
Surveys	1	DY	$ 2,646	NA	Unit pricing for surveying, if determined necessary by owner's representative. Assumes a minimum 10 by-10 foot grid and then use of a level and rod to measure elevations.
Excavated Soil Staging Pile Management	1	LS	$ 6,278	NA	Labor, equipment and materials to shape/compact stockpile and removal/placement of poly sheeting on working face, as determined necessary by owner's representative. Assumes work conducted during excavation activities for 304 cy of material (approximately 5 days).
Project Management/Construction Management					
Administration/Contractor Oversight	25%	of	$ 184,100	$ 46,000	CM, H&S, and CQM onsite, PM time
Owner's Representative Markup	5%	of	$ 184,100	$ 9,200	per contract rates
Total Capital Cost:				**$ 239,300**	
CLASS 2 RANGE:			**20%**	$ 287,200	
			-15%	$ 203,400	

[a] EA = each; LS = lump sum; TN = tons; DY = days; BCY = bank cubic yards; SF = square feet; CY = cubic yards; MO = months; MSF = thousand square feet; LF = linear feet

This construction cost estimate is not an offer for construction and/or project execution. The construction cost estimate for this Design is an Association for the Advancement of Cost Engineering (AACE) Class 2 estimate and is assumed to represent the actual total installed cost. The estimate above is considered control-level cost estimating, suitable for use in project budgeting and planning. This estimate has been prepared with partial design and engineering calculations. The level of accuracy for the class of estimate defines the upper and lower ranges of the cost estimate. It is based upon the level of design detail and uncertainty associate with that level of detail. For a Class 2 estimate, the accuracy range is +20% to -15%. It would appear prudent that internal budget allowances account for the highest cost indicated by this range as well as other site specific allowances. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, implementation schedule, and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.